DAMATIC
I/O Server

for Microsoft Windows

User Manual
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VALMET DAMATIC I/O Server

Overview

The **VALMET DAMATIC I/O Server** (hereafter referred to as the "DAMATIC I/O Server" or "Server") is a Microsoft Windows 32-bit application program (DAMATIC.EXE) that acts as a communication protocol *Server* and allows other Windows application programs access to data from the Damatic XD system's GTW:CIS (Gateway : Computer Interface Stations). The *Server* may be used by any Microsoft Windows program that is capable of acting as a DDE, FastDDE or SuiteLink *Client*.

The Damatic I/O Server requires an Ethernet card and TCP/IP protocol (supporting Windows Sockets interface) installed on the computer to communicate with the GTW:CIS connected to the Ethernet network. Any Ethernet network adapter (e.g. 3COM Etherlink III) may be used to communicate with the Damatic XD system.

Communication Protocols

Dynamic Data Exchange (DDE) is a communication protocol developed by Microsoft to allow applications in the Windows environment to send/receive data and instructions to/from each other. It implements a client-server relationship between two concurrently running applications. The server application provides the data and accepts requests from any other application interested in its data. Requesting applications are called clients. Some applications such as Wonderware InTouch and Microsoft Excel can simultaneously be both a client and a server.

FastDDE provides a means of packing many proprietary Wonderware DDE messages into a single Microsoft DDE message. This packing improves efficiency and performance by reducing the total number of DDE transactions required between a client and a server. Although Wonderware's FastDDE has extended the usefulness of DDE for our industry, this extension is being pushed to its performance constraints in distributed environments. The DAMATIC I/O Server supports the FastDDE Version 3 - an extension to Wonderware's proprietary FastDDE Version 2. This extension supports the transfer of Value Time Quality (VTQ) information. The original DDE and FastDDE Version 2 formats are still supported, providing full backward compatibility with older DDE clients. FastDDE Version 3 works on Windows 9x systems as well as Windows NT systems.

NetDDE extends the standard Windows DDE functionality to include communication over local area networks and through serial ports. Network extensions are available to allow DDE links between applications running on different computers connected via networks or modems. For example, NetDDE supports DDE between applications running on IBM compatible computers connected via LAN or modem and DDE-aware applications running on non-PC based platforms under operating environments such as VMS and UNIX.

SuiteLink uses a TCP/IP based protocol and is designed by Wonderware specifically to meet industrial needs such as data integrity, high-throughput, and easier diagnostics. This protocol standard is only supported on Microsoft Windows NT 4.0 or higher. SuiteLink is not a replacement for DDE, FastDDE, or NetDDE. The protocol used between a client and a server depends on your network connections and configurations. SuiteLink was designed to be the industrial data network distribution standard and provides the following features:

· Value Time Quality (VTQ) places a time stamp and quality indicator on all data values delivered to VTQ-aware clients.
· Extensive diagnostics of the data throughput, server loading, computer resource consumption, and network transport are made accessible through the Microsoft Windows NT operating system Performance Monitor. This feature is critical for the scheme and maintenance of distributed industrial networks.
· Consistent high data volumes can be maintained between applications regardless if the applications are on a single node or distributed over a large node count.
· The network transport protocol is TCP/IP using Microsoft's standard WinSock interface.

Accessing Remote Items via the I/O Server

The communication protocol addresses an element of data in a conversation that uses a three-part naming convention that includes the ***application name***, ***topic name*** and ***item name***. The following briefly describes each portion of this naming convention:

application name
The name of the Windows program (server) that will be accessing the data element. In the case of data coming from or going to Damatic XD system's GTW:CIS via this Server, the application portion of the address is **Damatic**.

topic name
Meaningful names are configured in the Server to identify specific devices. These names are then used as the topic name in all conversations to that device. For example, **XD1**.
Note! You can define multiple topic names for the same device (GTW:CIS) to poll different points at different rates.

item name
A specific data element within the specified topic. For example, when using this Server, items can be specified by configured table indexes or by names of Damatic XD variables in the Damatic XD system. The term "point" is used interchangeably with the term "item" in this User Manual. For more information on item/point names, see the "Item Names" section later in this manual.

Installing the DAMATIC I/O Server

Installing the I/O Server

The DAMATIC I/O Server installation package can be supplied:

1. As a self-extracting archive (09010xxx.EXE, where xxx is the current (latest) version of Server) if downloaded from Klinkmann's web site.
2. From installation on CD.
3. On two or three distribution disks (floppies).

To **install** the DAMATIC I/O Server from the self-extracting archive, run the 09010xxx.EXE and proceed as directed by the DAMATIC I/O Server Setup program.

To **install** the DAMATIC I/O Server from CD or distribution disks, on MS Windows NT, 2000, XP or 95(98):

1. Insert the CD with Klinkmann Software into CD drive or insert the DAMATIC I/O Server Disk1 into a floppy drive A: or B:.
2. Select the **Run** command under the **Start** menu.
3. Run STARTUP.EXE if installing from CD or SETUP.EXE if installing from distribution disks (floppies).
4. If installing from CD: select "Protocol Servers (DDE, SuiteLink, OPC)", find "DAMATIC SL and DDE Server" and click on "Setup…".
5. Proceed as directed by the DAMATIC I/O Server Setup program.

When installation is finished, the subdirectory specified as a folder where to install the DAMATIC I/O Server files will contain the following files:

DAMATIC.EXE The DAMATIC I/O Server Program. This is a Microsoft Windows 32-bit application program.

DAMATIC.HLP The DAMATIC I/O Server Help file.

DAMATIC.CFG An example configuration file.

LICENSE.TXT Klinkmann Automation software license file.

To **uninstall** the DAMATIC I/O Server, start Control Panel, select "Add/Remove Programs" and select the "DAMATIC IO Server" from the list of available software products. Click on "Add/Remove…" and proceed as directed by the UnInstallShield program.

Notes:

1. *The DAMATIC I/O Server is developed with Wonderware I/O Server Toolkit (ver 7.0) and needs the **Wonderware FS2000 Common Components** to be installed on computer where the DAMATIC I/O Server is running. The Wonderware FS2000 Common Components are installed automatically when any of Wonderware FS2000 Components (e.g. InTouch or some Wonderware I/O server) is installed.*

2. *If DAMATIC I/O Server will run on PC where Wonderware FS2000 Common Components are not installed then a special **I/O Server Infrastructure installation package** can be obtained from Klinkmann Automation (see **Installing the I/O Server Infrastructure** section below). This I/O Server Infrastructure installation package contains the minimum set of software needed to run the DAMATIC I/O Server and these infrastructure files must be install prior to executing the DAMATIC I/O Server.*
3. *The HASP key is needed for full time running of DAMATIC I/O Server. The HASP Driver setup is performed during the Server setup. Without HASP Driver installed the DAMATIC I/O Server will run only 1 hour (with all features enabled).*

Installing the I/O Server Infrastructure

The I/O Server Infrastructure installation package can be supplied:

1. As a self-extracting archive (IOServerInfrastructure.exe) if downloaded from Klinkmann's web site.
2. On one distribution disk (floppy).

To **install** the I/O Server Infrastructure from the self-extracting archive, run the IOServerInfrastructure.exe and proceed as directed by the I/O Server Infrastructure Setup program.

To **install** the I/O Server Infrastructure from the distribution disk, on MS Windows NT:

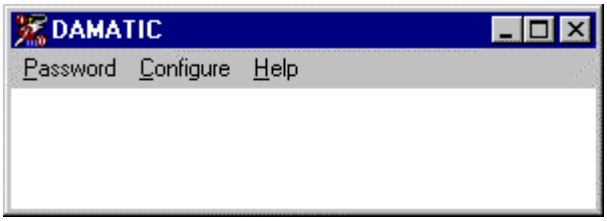
1. Insert the I/O Server Infrastructure disk into a floppy drive A: or B:.
2. Select the **Run** command under the **Start** menu.
3. Type "A:SETUP" or "B:SETUP".
4. Click on **OK**.
5. Proceed as directed by the I/O Server Infrastructure Setup program.

To **uninstall** the I/O Server Infrastructure, start Control Panel, select "Add/Remove Programs" and select the "IO Server Infrastructure" from the list of available software products. Click on "Add/Remove…" and proceed as directed by the UnInstallShield program.

***Note:** The I/O Server Infrastructure installation will be rejected if Wonderware FS2000 Common Components are already installed on same computer.*

Starting the DAMATIC I/O Server

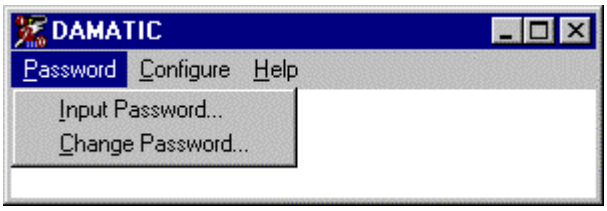
After the DAMATIC Server is initially installed, start up the DAMATIC program. If the Server starts up as an icon, double-click on the icon to open the server's main window. The following will appear:



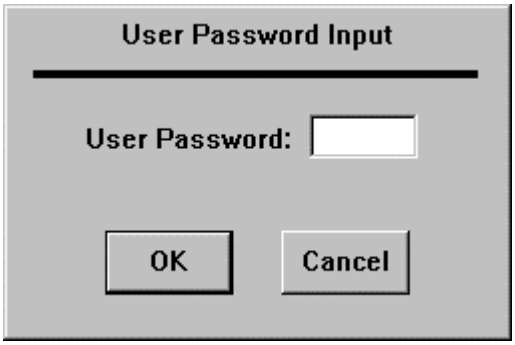
User Password

The *Server* includes commands for *User Password* input and change. If the password is valid then the user can read and write data from/to the Damatic XD system. The user also can work with the default password - in this case he can only read data from the Damatic XD system. Up to eight characters can be set as a user password.

To access the commands used for password input and change, open the */Password* menu:

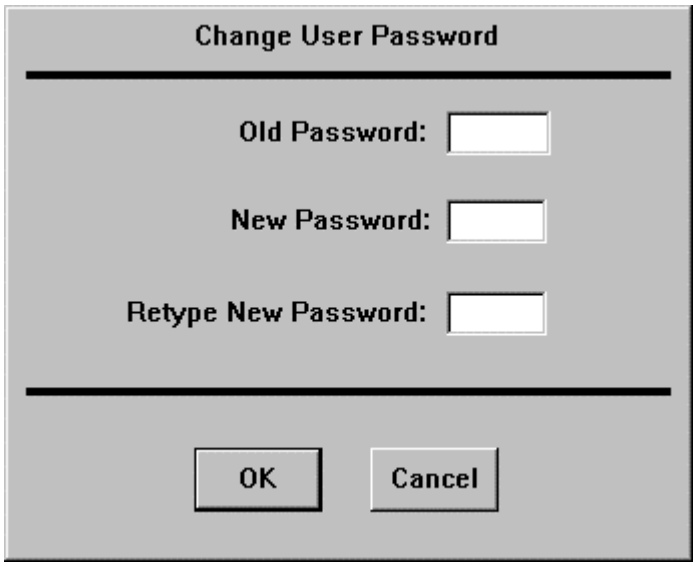


Input Password
To input a user password (perform a registration) invoke the **Input Password...** command and "User Password Input" dialog box will appear:



Type the user password in the *User Password:* field. The typed characters are displayed as asterisks. Click on **OK** to process the typed value or click on **Cancel t**o continue without registration.

Change Password
To change a user password invoke the **Change Password...** command and "Change User Password" dialog box will appear:



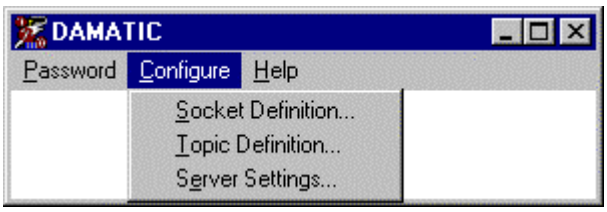
Type the appropriate values in the *Old Password:*, *New Password:* and *Retype New Password:* fields. The typed characters are displayed as asterisks. Click on **OK** to process the typed values or click on **Cancel t**o continue without user password changing.

Note: *The User Password checking can be disabled by adding PasswordNotUsed=1 entry in the WIN.INI file (see "Troubleshooting/WIN.INI" entries section).*

Configuring the DAMATIC I/O Server

After the DAMATIC I/O Server is initially installed, a small amount of configuration is required. Configuring the Server automatically creates a **DAMATIC.CFG** file which holds all of the topic definitions entered, as well as the configuration of sockets. This file will automatically be placed in the same directory in which **DAMATIC.EXE** is located unless the path where the configuration file will be placed is a specified via the */Configure/Server Settings...* command.

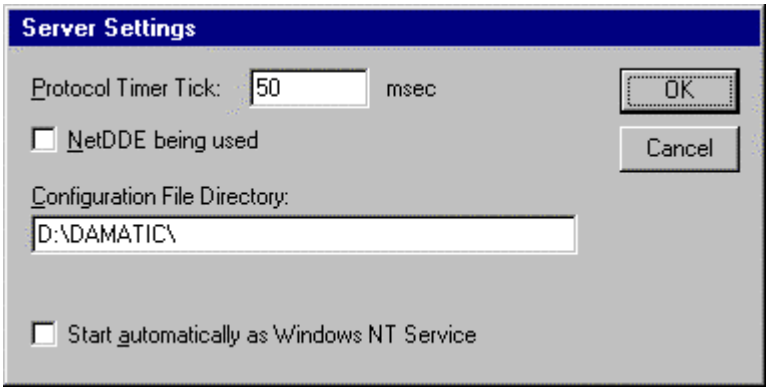
To access the commands used for the various configurations, open the */Configure* menu:



Server Settings Command

A number of parameters that control the internal operation of the Server can be set. In most cases, the default settings for these parameters provide a good performance and do not require changing. However, they can be changed to fine-tune the Server for a specific environment.

To change the Server's internal parameters, invoke the *Configure/Server Settings...* command. The "Server Settings" dialog box will appear:



The following describes each field in this dialog box:

Protocol Timer Tick
This field is used to change the frequency at which the Server checks for data to process. This frequency real value depends on total amount of data the Server is requesting from the Damatic XD system. The desired **Protocol Timer Tick** value must be enough to allow process all requests at the shortest time desired to update data from the Damatic XD system. The default value is 50 milliseconds.

NetDDE being used
Select this option if you are networking using Wonderware NetDDE.

Configuration File Path
The first field is used to specify the path (disk drive and directory) in which DAMATIC will save its current configuration file. The DAMATIC.EXE will use this path to load the configuration file the next time it is started.

Note: *Only the "path" may be modified with this field. The configuration file is always named* ***DAMATIC.CFG.***

Note: *There is no limit to the number of configuration files created, although each must be in a separate directory. When using the DAMATIC Server with* ***InTouch****, it is a good practice to place the configuration file in the application directory.*

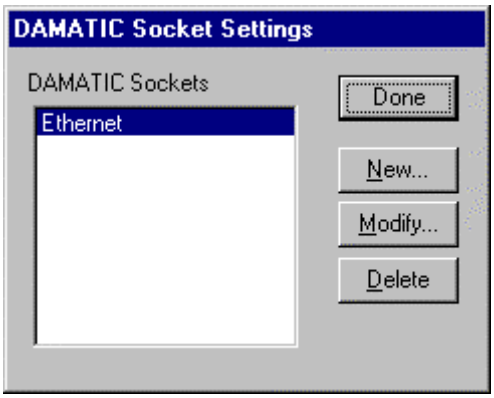
Start automatically as Windows NT Service
Enabling this option will cause the server to start as a Windows NT service.

Windows NT offers the capability of running applications even when a user is not logged on to the system. This is valuable when systems must operate in an unattended mode. Enabling this option and rebooting the system will cause the Server to run as a Windows NT service. However, to view configuration information or to reconfigure the Server, the user must log on to the system. Any Server related problems that may arise such as missing adapter cards, licensing failures or device drivers not loading will not be visible to the user until a log on is performed. Disabling this option and rebooting the system will cause the Server to run as a Windows NT application program once again.

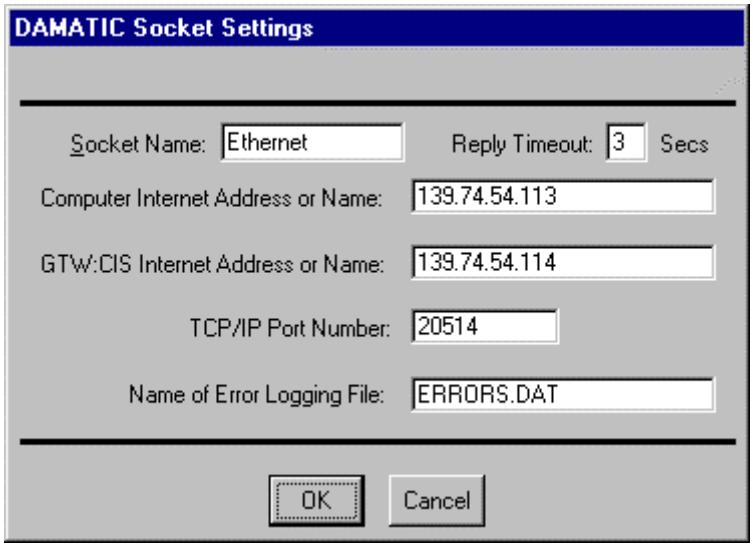
When all entries have been made, click on **OK**.

Socket Definition Command

To configure the Socket used for communications with Damatic XD system's GTW:CIS, invoke the */Configure/Socket Definition...* command. The "DAMATIC Socket Settings" first dialog box will appear:



To modify or examine an existing Socket, select the Socket name and click on **Modify**. To define a new Socket, click on **New**. The "DAMATIC Socket Settings" second dialog box will appear:



The following describes each dialog field in this dialog box:

Socket Name
Enter the Socket name and later use it in the *Topic Definition*. Only one Socket with same **Computer Internet Address or Name**, **GTW:CIS Internet Address or Name** and **TCP/IP Port Number** can be defined, so only one Socket can be defined for each GTW:CIS.

Reply Timeout
This field is used to enter the amount of time (in seconds) the GTW:CIS will be given to reply to commands from the Server.

Computer Internet Address or Name
Enter the Computer Internet Address (IP Address) or Name.

GTW:CIS Internet Address or Name
This field is used to enter the GTW:CIS Internet Address (IP Address) or Name.

TCP/IP Port Number
This field is used to enter the GTW:CIS TCP/IP port number.

Name of Error Logging File
This field is used to enter the name of file, which will contain all error messages received from the Damatic XD system. The default name is ERRORS.DAT. This file is updated if it becomes greater than 100 Kbytes or if included error messages are more than 1 week old. If this field is empty then no error logging is performed.

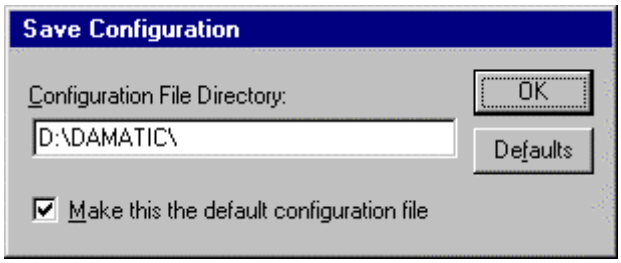
Once all entries have been made, click on **OK** to process the configuration for the Socket. The "DAMATIC Socket Settings" first dialog box will appear again.

Click on **Done** when configuration for all Sockets has been performed.

Note: *If this is the first time the Sockets have been configured, the user will be prompted to save configuration to an existing directory.*

Saving DAMATIC I/O Server Configuration File

If the configuration file does not currently exist, or a new configuration path has been specified, the Server will display the "Save Configuration" dialog box:



This dialog box displays the path where the Server is going to save the current configuration file. The path may be changed if necessary. Also, the path can optionally be recorded in the **WIN.INI** file by selecting the **"Make this the default configuration file"** option. Doing so it will allow the DAMATIC I/O Server to find the configuration file automatically each time it is started.

Configuration File Location

When the DAMATIC Server starts up, it first attempts to locate its configuration file by, first checking the **WIN.INI** file for a path that was previously specified. If the path is not present in the **WIN.INI** file, the Server will assume that the current working directory is to be used.

To start the Server from an application directory configuration file other than the default configuration file a special switch **(/d:)** is used. For example, invoke the **File/Run** command and enter the following command:

DAMATIC /d:c:\path

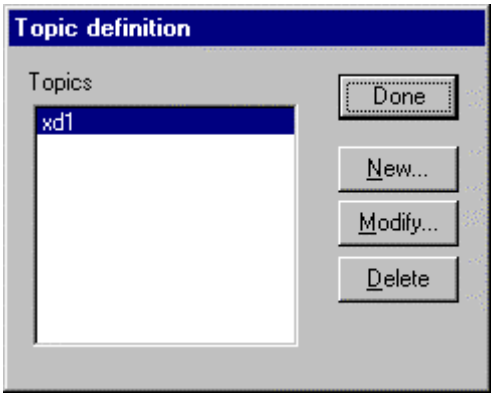
Note: *There is no limit to the number of configuration files that may be created, although each must be in a separate directory.*

Topic Definition Command

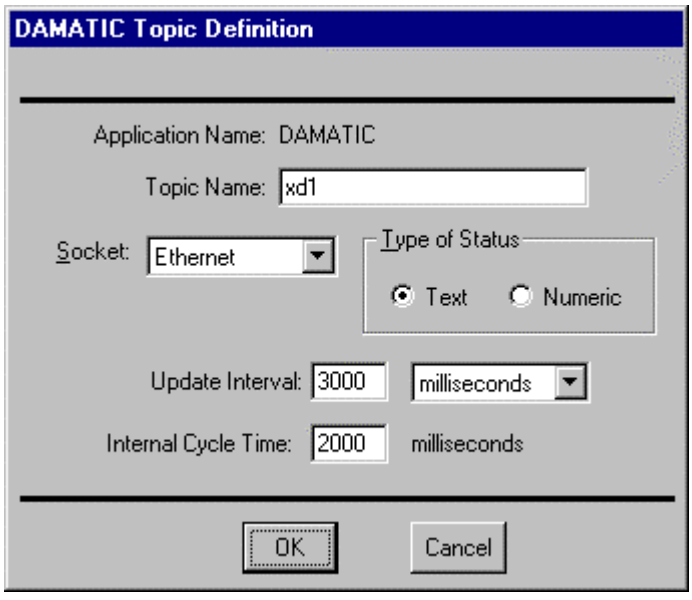
The DAMATIC I/O Server allows connection to one or more GTW:CIS and supports multiple topics, allowing different data update rates for each topic. The user provides each topic with an arbitrary name used as the Topic Name for all references to this topic.

The following steps are taken to define the Topic:

1. Invoke the *Configure/Topic Definition…* command. The "Topic definition" dialog box will appear:



2. To modify an existing topic, select the topic name and click on **Modify**. To define a new topic, click on **New**. The “DAMATIC Topic Definition” dialog box will appear:



3. Enter the **Topic Name**.

   Note: *If using **InTouch** the same Topic Name is to be entered in the "Add Access Name" dialog box described in the **Using the DAMATIC I/O Server with InTouch** section.*

4. Select the **Socket** to associate it with the topic. Additional topics may be associated with the same Socket at a later time.

5. Set the **Type of Status** for this topic. This field is used to enter the interpretation type of status (failbits) received from the Damatic XD system. The possible selections are text (default) or numeric.

6. Set the **Update Interval** field to indicate the frequency (in configurable units (milliseconds, seconds, minutes, hours)) at which the values of items will be read (polled) from the Damatic XD system. The default value is 3 seconds. The **Update Interval** must be greater than the *Damatic XD system internal cycle time*

7. Enter the **Internal Cycle Time** value. This field is used to enter the Damatic XD system internal cycle time - the frequency at which the data is updated from Process Stations (PCS) to CIS memory. The possible values are from 100 milliseconds to 25 seconds, the default value is 2000 milliseconds. It is not recommended that this value is less than 500 milliseconds.

Once all entries have been made, click on **OK** to process the configuration for the Topic. The "Topic definition" dialog box will appear again.

Select **Done** when configuration for all Topics has been performed.

Item Names

The Damatic I/O Server supports following types of tags (items): Discrete (Boolean), Integer (32 bits), Real (floating point) and Message (string, used only for fault status). Integer and Real Read Only arrays (vectors) are supported, but if Damatic XD variable is an element of vector then it is Read/Write, i.e. it is possible to write into the vector element. Each item has its unique name, maximum length of name is 67 characters and first character of name must be a letter.

The *Server* supports reading/writing data from/to to the Damatic XD system both by means of configured table **indexes** and by **names** of Damatic XD variables. The item name generally may be described as:

P”item name”[**1**] [**S**]

where

item name - Damatic XD index or variable name which always must be included in “”; the maximum length of **item name** is 63 characters.

P - item name prefix, e.g. one character before first “ and represents item type:
d or **D** - Discrete,
i or **I** - Integer,
r or **R** - Real.

[**1**] - optionally used item name suffix for one-time request indication; in this case the **item name** must be Damatic XD variable name (index is not allowed) and no connection to name will be opened, the item value will be read only once by cnp_read_value_of_name function.

[**S**] - item name suffix, possible values are:

1) **F** or **f**, used only for items which corresponds to **fault status** (return value from XD-LINK library's functions **cnp_get_rr_buf_data** or **cnp_vect_fails**); the type of these Read Only items depends on the current setting of *type of the status of values* for Topic:

- if the *type of the status of values* is numeric then type of item type is Integer and it contains return value in binary format;
- if the *type of the status of values* is text then type of item type is Message and it contains character string with the combination of received fault bits in text format (e.g. if there is no error then this character string is empty or if bits b1, b3 and b4 are set to 1 then this string will contain "ext.dis.inv").

2) **V** or **v**, used only for items which are whole vectors and the vector notation is not included in the "item name", e.g. **r":e:pr:lic100"v**.

3) **W** or **w** , used for:
- items which are used for writing to preconfigured table indexes, because the same index value can be used in read and write blocks; therefore indexes are divided in two groups: Read Only indexes (e.g. **r"1"**) and Write Only indexes, e.g. **r"1"w**;
- items which are used for writing directly to name without creating connection to name; these items are Write Only (they are not polled), for example the item **r":e:pr:4XIS5ANA4"w** can be used to write new values to Damatic XD variable **:e:pr:4XIS5ANA4** without creating connection to this variable.

If the "item name" contains the notation for table information (**:elem ()** with some digits and minus sign included inside brackets) then this item is processed as a vector (array) or an element of vector. For example, **l":e:pr:lic100:elem(1-10)"** could be the item name for Damatic XD variable with name **:e:pr:lic100:elem(1-10)** and this Damatic XD variable is a vector with 10 integers.

For each Topic there is a special Integer Read/Only item **NOF_PENDING_WRITES** implemented. This item can be used to monitor how many not executed write commands are waiting. To avoid the increasing of memory occupied by not executed write commands, the **NOF_PENDING_WRITES** item can be used in the following way:
- activate the hot link with **NOF_PENDING_WRITES** item and start to monitor it;
- activate new write command (by poking new values) only if value of **NOF_PENDING_WRITES** becomes equal to 0, e.g. all previous writes are executed and memory occupied by them is freed.

Note: *It is strongly recommended to use consecutive Write Only indexes when executing a big amount of writes (e.g. 512 values) at once. Otherwise there can considerable delays before executing these writes first time - the new value to Write Only index can be written only after the type of this Damatic XD pre-configured table index is obtained from Damatic XD system. If addresses of indexes are consecutive then Server can do it by one or few additional "read XD type" commands, but if addresses are scattered then many "read XD type" commands could be needed. In this case the special item NOF_PENDING_WRITES item could be useful to determine when the write command is completed.*

For each Topic there is a Discrete item with name **STATUS** that indicates the state of communication with this Topic. This item is set to 0 when communication with the Topic fails and set to 1 when communication is successful.

For each Topic the special Discrete Read/Only item **KEEPALIVE** can be activated. The value of **KEEPALIVE** changes from 0 to 1 or from 1 to 0 when any command is sent to this Topic (GTW:CIS). This item can be used to create artificial delivery of new data from Server to client application if needed (for example, if accessing to Damatic data from Wonderware IndustrialSQL Server and no new values are received from GTW:CIS).

Examples of item names:

d"24" - Discrete, Read Only, corresponds to preconfigured table index 24 zero or non-zero value;

i":e:pr:JVETCNP1:out" - Integer, Read/Write, corresponds to Damatic XD variable :e:pr:JVETCNP1:out;

r":e:pr:4XIS5ANA4" - Real, Read/Write, corresponds to Damatic XD variable :e:pr:4XIS5ANA4;

R":e:pr:lic100"v - Damatic XD vector which contains floating point data and corresponds to Damatic XD variable :e:pr:lic100; the whole vector will be read;

R":e:pr:lic100"vf - Message (the *type of the status of values* is set to text), Read Only, contains return value (all fault bits) for Damatic XD real vector :e:pr:lic100;

i":e:pr:lic100:elem(1-10)" - Damatic XD vector which contains integer data and corresponds to Damatic XD vector :e:pr:lic100; first 10 elements will be read from this vector;

i":e:pr: lic100:elem(4)" - Integer, Read/Write, corresponds to element with address 4 from Damatic XD integer vector :e:pr: lic100;

R"10"w - Real, Write Only, used for writing of float data to preconfigured table index 10;

R"10"f - Integer (the *type of the status of values* is set to numeric), Read Only, corresponds to preconfigured table index 10 (value in table is float) fault status value;

i":e:pr:lic100:elem(6)"F - Message (the *type of the status of values* is set to text), Read Only, contains return value (all fault bits) for Damatic XD variable :e:pr:lic100:elem(6);

i":e:pr:2XIS5INTS2"1 - Integer, will be read only once and and no connection to name will be opened; corresponds to Damatic XD variable :e:pr:2XIS5INTS2.

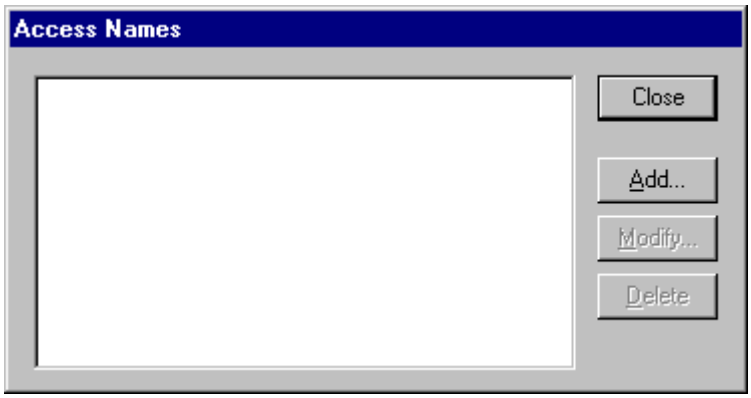
Using the DAMATIC I/O Server with InTouch

To access to items/points on the Damatic XD system from **InTouch**, the Access Names and Tag names should be defined in **WindowMaker**.

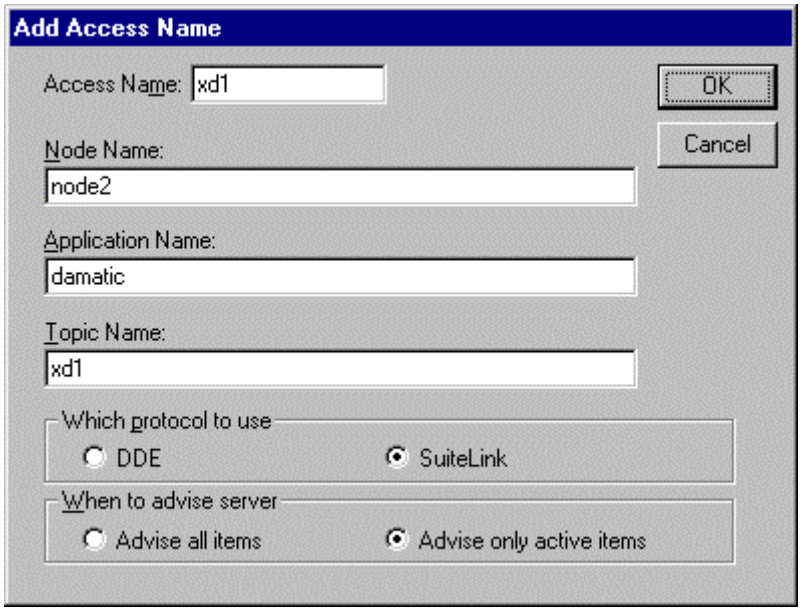
Defining the Access Names

InTouch uses **Access Names** to reference real-time I/O data. Each Access Name equates to an I/O address, which can contain a **Node**, **Application**, and **Topic**. In a distributed application, I/O references can be set up as global addresses to a network I/O Server or local addresses to a local I/O Server.

To define the Access Names in WindowMaker node invoke the */Special/Access Names...* command. The "Access Names" dialog box will appear.



Click on **Add…**. The "Add Access Name" Dialog Box will appear:



***Note:** If **Add** is selected, this dialog box will be blank when it initially appears. Data has been entered here to illustrate the entries that are made.*

The following fields are required entries when entering an Access Name Definition:

Access Name
In the Access Name box type the name you want InTouch to use to this Access Name. (For simplicity, use the same name that you will use for the **Topic Name** here.)

Node Name
If the data resides in a network I/O Server, in the Node Name box, type the remote node's name.

Application Name
In the Application Name box, type the actual program name for the I/O Server program from which the data values will be acquired. In case the values are coming from the DAMATIC I/O Server the DAMATIC is used. Do not enter the .exe extension portion of the program name.

Topic Name
Enter the name defined for the topic in the DAMATIC I/O Server to identify the topic the DAMATIC I/O Server will be accessing.
The Topic Name is an application-specific sub-group of data elements. In the case of data coming from a DAMATIC I/O Server program, the topic name is the exact same name configured for the topic in the DAMATIC I/O Server.

Note: *This will usually be the same as the "Access Name", although, if desired, they may be different. However, it must be the same name used when the topics were configured in section* ***Configuring the DAMATIC I/O Server***.

Which protocol to use
Select the protocol (DDE or Suite Link) that you are using.

When to advise server
Select **Advise all items** if you want the Server program to poll for all data whether or not it is in visible windows, alarmed, logged, trended or used in a script. Selecting this option will impact performance, therefore its use is not recommended.

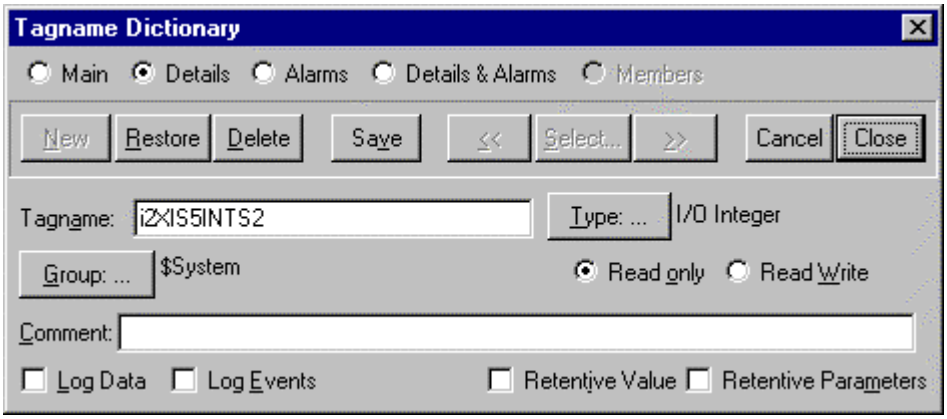
Select **Advise only active items** if you want the Server program to poll only points in visible windows and points that are alarmed, logged, trended or used in any script.

Click **OK** to accept the new Access Name and close the “Add Access Name” dialog box. The “Access Names” dialog box will reappear displaying the new Access Name selected in the list.

Click **Close** to close the “Access Names” dialog box.

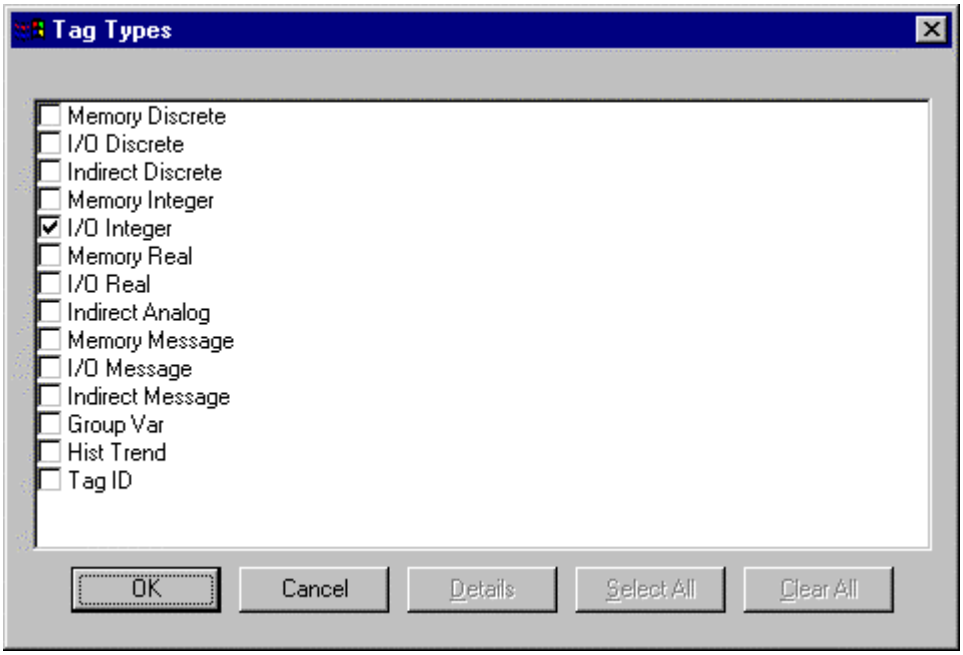
Defining the Tag names

To define the Tag names associated with the new "Access Name", invoke the */Special/Tagname Dictionary...* command (in **WindowMaker**). The "Tagname Dictionary " dialog box will appear:



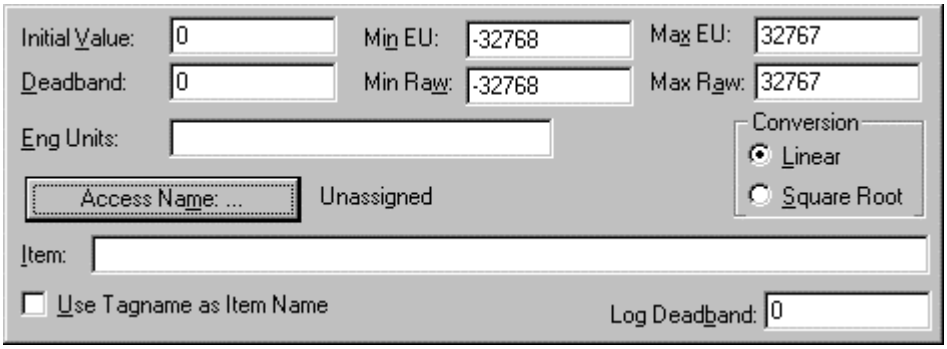
Click on **New** and enter the **Tagname**. (The tagname defined here is the name **InTouch** will use. The DAMATIC I/O Server does not see this name.)

Select the tag type by clicking on the **Type:…** button. The "Tag Types" dialog box will appear:

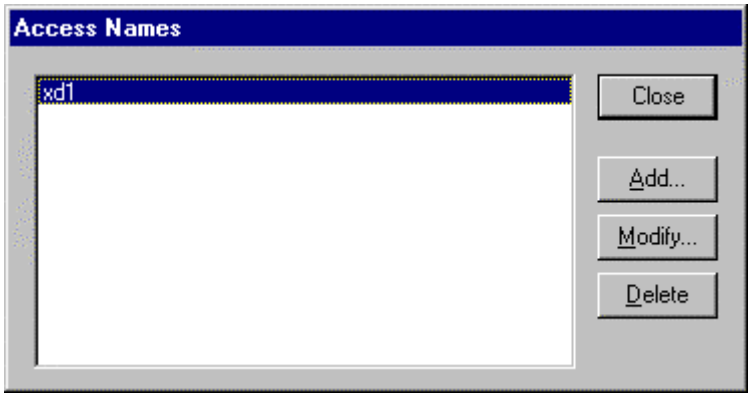


To access DAMATIC items, the type must be **I/O Discrete**, **I/O Integer**, **I/O Real** or **I/O Message**. Select the Tag type.

The "Details" dialog box for the tag name will appear:

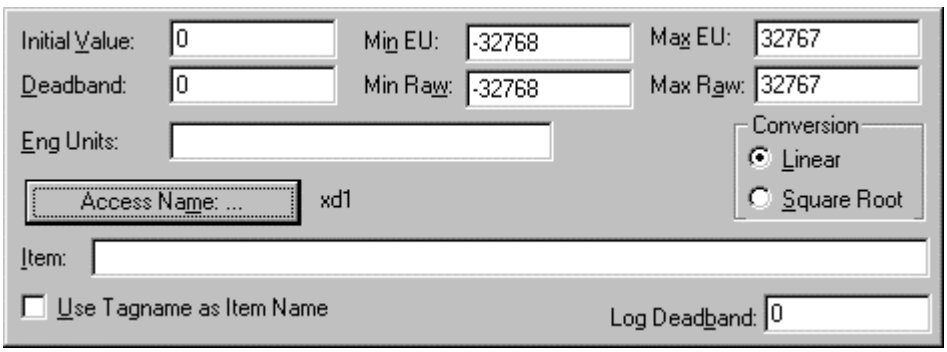


Select the Access name for DAMATIC I/O Server by clicking on the **Access Name:…** button. The "Access Names" dialog box will appear:



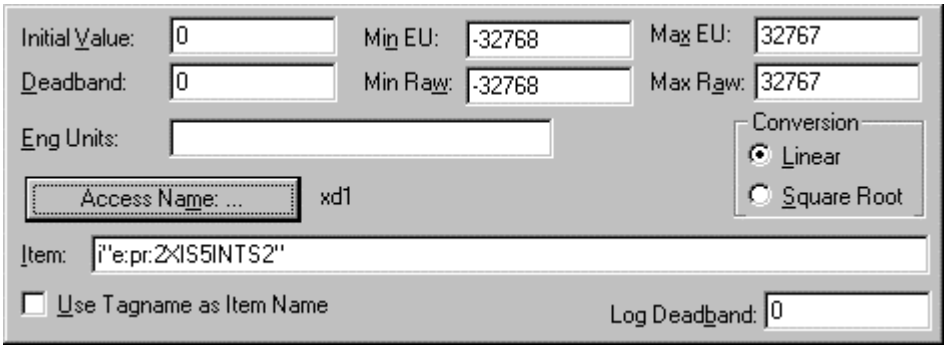
Select the appropriate Access Name and click on **Close**. (If the Access Name has not been defined as previously described, click on **Add** and define the Access Name now.)

The "Details" dialog box will appear displaying the selected Access Name:



For integers and reals fill in the **Min EU**, **Max EU**, **Min Raw** and **Max Raw** fields. These fields control the range of values that will be accepted from the Server and how the values are scaled. If no scaling is desired, **Min EU** should be equal to **Min Raw** and **Max EU** equal to **Max Raw**.

Enter the DAMATIC item name to be associated with this tagname in the **Item:** field in the "Details" box:



(Refer to the **Item Names** section below for complete details.)

Where applicable, the **Use Tagname as Item Name** option may be selected to automatically enter the tag name in this field. ***Note:*** *The tag name can only be used if it follows the conventions listed in the* ***Item Names*** *section.*

Once all entries have been made, click on the **Save** button (in the top dialog box) to accept the new tagname. To define additional tagnames click on the **New** button. To return to the **WindowMaker** main screen, select **Close**.

Notes on Using Microsoft Excel

Data from the DAMATIC XD system may be accessed from Excel spreadsheets. To do so, enter a formula like the following into a cell on the spreadsheet.

=DAMATIC|'topic'!'item'

In the formula, **topic** must be replaced with one of the valid topic names defined during the Server configuration process. Replace **item** with one of the valid item names specified like described in the **Item Names** section.

Reading Values into Excel Spreadsheets

Values may be read directly into Excel spreadsheets by entering a DDE formatted formula into a cell, as shown in the following examples:

=DAMATIC|'xd1'!'i":e:pr:2XIS5INTS2"'
=DAMATIC|'GTWCIS'!'i":e:pr: lic100:elem(4)"'
=DAMATIC|'xd'!'R"10"f'

Vectors (arrays) may be read directly into Excel spreadsheets by selecting the range of cells in which you want to read the vector data, then building a DDE formatted formula, as shown in the following example:

=DAMATIC|'xd1'!'R":e:pr:2XIS5ANAV"v'

and then you must press CTRL+SHIFT+ENTER to execute a formula.

Note: *Refer to the Microsoft Excel manual for complete details on entering Remote Reference formulas for cells.*

Writing Values to DAMATIC I/O Server Points

Values may be written to the Server from Microsoft Excel by creating an Excel macro that uses the **POKE** command. The proper command is entered in Excel as follows:

channel=INITIATE("DAMATIC","topicname")
=POKE(channel,"itemname", Data_Reference)
=TERMINATE (channel)
=RETURN()

The following describes each of the above **POKE** macro statements:

channel=INITIATE("DAMATIC","topicname")
Opens a channel to a specific topic name (defined in the Server) in an application with name DAMATIC (the executable name less the .EXE) and assigns the number of that opened channel to **channel.**

Note: *By using the* ***channel=INITIATE*** *statement the word* ***channel*** *must be used in the* ***=POKE*** *statement instead of the actual cell reference. The* ***"applicationname"*** *and* ***"topicname"*** *portions of the formula must be enclosed in quotation marks.*

=POKE(channel,"itemname", Data_Reference)
POKEs the value contained in the **Data_Reference** to the specified item name (actual location in the Damatic XD system) via the **channel** number returned by the previously executed **INITIATE** function. **Data_Reference** is the row/column ID of the cell containing the data value. For **"itemname"**, use some of the valid item names specified like described in the **Item Names** section. (***Note:*** *Inside* **"itemname"***quotation marks which belong to item name must be duplicated, e.g.* ***"i””:e:pr:4XIS5ANA2””w"***).

=TERMINATE(channel)
Closes the channel at the end of the macro. Some applications have a limited number of channels. Therefore they should be closed when finished. **Channel** is the channel number returned by the previously executed **INITIATE** function.

=RETURN()
Marks the end of the macro.

The following is an example of Excel macro used to poke value from cell B2 to item i":e:pr:4XIS5ANA2"w:

```
PokeMacro -Ctrl a
=INITIATE("DAMATIC","xd1")
=POKE(A2,"i"":e:pr:4XIS5ANA2""w",B2)
=ON.TIME(NOW()+0.01,"TerminateDDEChannel")
=RETURN()

TerminateDDEChannel
=TERMINATE(A2)
=RETURN()
```

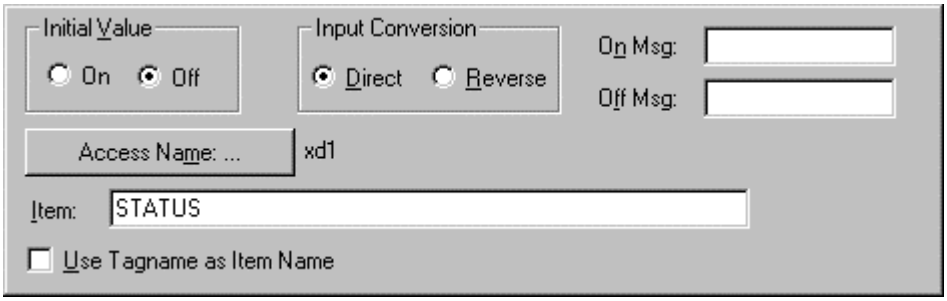
Note: *Refer to the Microsoft Excel manual for complete details on entering Remote Reference formulas for cells.*

Troubleshooting

Monitoring the Status of Communication with GTW:CIS

For each topic, there is a built-in discrete item which indicates the state of communication with the GTW:CIS. The discrete item (**STATUS**) is set to **0** when communication fails and set to **1** when communication is successful.

From **InTouch** the state of communication may be read by defining an I/O Discrete tagname and associating it with the topic configured for the GTW:CIS and using **STATUS** as the *Item* name.



From **Excel**, the status of the communication may be read by entering the following formula in a cell:

=DAMATIC|topic!STATUS

Monitoring the Status of Communication with InTouch

InTouch supports built-in topic names called **DDEStatus** and **IOStatus** that are used to monitor the status of communications between the Server and InTouch. For more information on the built-in topic names DDEStatus and IOStatus, see your online "InTouch User's Guide".

The status of communication between the Server and InTouch can be read into **Excel** by entering the following DDE reference formula in a cell on a spreadsheet (in following examples **xd1** is the Topic Name configured for DAMATIC I/O Server):

=view|DDEStatus!xd1
or
=view|IOStatus!xd1

Delay during opening "connections to names"

If many connections to names of XD variables must be opened simultaneously then there would be a considerable delay before all modules to CIS are opened. In **Excel** each cell contains "#N/A" until channel is opened and first data value is received. In **InTouch** the end of this delay can be determined by setting some impossible value (e.g. "empty" for I/O Message type items) as *Initial Value* and then waiting the change of this initial value.

CONNECTI.ONS file

When the *Server* is active (at least one socket is opened) all opened connections to names of XD variables are stored in the **CONNECTI.ONS** file. When the *Server* is shut down or connection with socket is closed (when last topic belonging to this socket is deactivated), all opened connections are still in **CONNECTI.ONS** file. So, if some error occurs (the *Server* is not shut down normally) then all unreleased connections still remain in the **CONNECTI.ONS** file. When starting the *Server* next time or activating new connection with some socket, before opening new connections at first all unreleased connections are read from **CONNECTI.ONS** file and released.

GTW:CIS reseted and wrong sequence ID errors

If Error Code 2004 (“GTW:CIS has been reseted”) is received from the GTW:CIS when conversation between the *Server* and Damatic XD system is active then following message is logged to Wonderware Logger:

"GTW:CIS GTW:CIS has been reseted. All I/O links must be re-established!"

and the *Server* starts to wait for re-establishing of I/O links.

Also if packet with wrong sequence ID is received from the GTW:CIS then following message is logged:

" Packet with wrong sequence ID received. To restore communications all I/O links must be re-established! "

and the *Server* starts to wait for re-establishing of I/O links.

To perform this re-establishing the following must be done:

In **Excel** all spreadsheets containing DDE channels must be closed and then re-opened. During each spreadsheet re-opening Excel displays message “Re-establish remote links?” and waits for user reply. If user reply is **Yes** then all DDE links are re-established.

In **InTouch** the re-establishing of I/O links can be performed by *Special\Reinitialize I/O* option from WindowViewer main menu.

The DAMATIC I/O Server waits for reply to each message sent to GTW:CIS, i.e. next command to GTW:CIS can not be sent before answer to previous command is received (each message has it's *sequence number of message* and if next command to GTW:CIS is sent before answer to previous answer is received then the order of these *sequence numbers* can be destroyed).

If for some reason the GTW:CIS temporarily stops responding to commands from Server, then the situation when communication is "freezed" can happen. In this case only way to restore the communication is to perform the re-establishing of I/O links.

WIN.INI entries

The first time you run the DAMATIC I/O Server configuration, most of the items in the following list will automatically appear in the WIN.INI file. It is usually in the C:\WINDOWS directory. It is an ASCII file and can be altered manually if you wish with any text editor, e.g. MS Windows Notepad (*Do not use a program that formats text, such as MS Word unless the file is saved as DOS text*). The following is a typical entry for the DAMATIC I/O Server:

[DAMATIC]
WinIconic=0
WinFullScreen=0
WinTop=113
WinLeft=251
WinWidth=345
WinHeight=214
PortErrorRetries=3
SlowPollInterval=120

UseDamaticTime
As default, the DAMATIC I/O Server uses the computer local time when delivering VTQ time stamping info to Wonderware clients (e.g. InTouch and InSQL) via the Suitelink protocol. It is possible to use the time stamp info received from GTW:CIS by adding the following entry to WIN.INI file [DAMATIC] section:

UseDamaticTime=1

If there is no UseDamaticTime= entry in WIN.INI [DAMATIC] section or UseDamaticTime=0 then computer local time is used in VTQ info delivered to client applications.

SlowPollInterval and **PortErrorRetries**
The **PortErrorRetries** entry is used to enter the number of consecutive error retries for one socket. If after **PortErrorRetries** the command still cannot be sent or still error response is received, then this socket is changed to *slow poll mode*. The WIN.INI file **SlowPollInterval** entry is used to enter the slow poll mode update interval (in seconds).

The **PortErrorRetries** and **SlowPollInterval** also is used if GTW:CIS is not replying to command sent from Server. Then after **PortErrorRetries** attempts to receive the answer the Server starts to "sleep" between read attempts. In this case the **SlowPollInterval** is used as a "sleep" delay.

The communication state item (**STATUS**) is set to **0** after **PortErrorRetries** unsuccessful retries.

The default values (they are used if WIN.INI file does not contain these entries) are **PortErrorRetries** equal to 2 and **SlowPollInterval** equal to 60 seconds.

MaxReadIndexes and **MaxWriteIndexes**
The default number of maximum write and read indexes processed in one command is set to 512 values both for write and read commands. This default value is possible to change by adding some lines in the WIN.INI file [DAMATIC] section like:

MaxWriteIndexes=200
MaxReadIndexes=100

In above case there will be maximum 200 writes in one indexed write command and maximum 100 reads in one indexed read command. These values can be adjusted to achieve the best performance of execution.

WriteRetryIndefinitely
As default, the DAMATIC I/O Server tries to execute the *write* and *create connection to name* commands **PortErrorRetries** times (if error response is received) or waits for answer to these commands **PortErrorRetries** * **Reply Timeout** (entered at "DAMATIC Socket Settings") seconds. If still there is no good response then these commands are rejected. It is possible to use the special WIN.INI [DAMATIC] section entry

WriteRetryIndefinitely=1

to configure the Server to wait for responses to *write* and *create connection to name* commands **indefinitely**, i.e. until some answer is received. This entry should be used with care, because in case if communication with GTW:CIS is with delays it can "freeze" the data exchange between Server and GTW:CIS.

NoZeroOnItemActivation
As default, the DAMATIC I/O Server does not deliver any value for non-string items to client application immediately after the item is activated. This default seting is active if in WIN.INI [DAMATIC] section there is following entry

NoZeroOnItemActivation=1

or there is no NoZeroOnItemActivation= entry in WIN.INI [DAMATIC] section.

To deliver the value of 0 (zero) for non-string items to client application immediately after the item is activated, the following WIN.INI [DAMATIC] section entry can be used:

NoZeroOnItemActivation=0

It is also possible to deliver any other initial value (except 0 or 1) for non-string items to client application immediately after the item is activated. This can be done by entering the necessary initial value to NoZeroOnItemActivation= entry, for example the following string:

NoZeroOnItemActivation=99

will cause the initial value of 99 to be to delivered to client application immediately after the item is activated.

ConnectionNameValueOK and **ConnectionNameValueBad**
Two special WIN.INI [DAMATIC] section entries **ConnectionNameValueOK=** and **ConnectionNameValueBad=** can be used to determine the execution result of *connection to Damatic XD variable name* command. As default, the client application can determine the successful connection to name by receiving the first data value. Sometimes it can be necessary to determine this connection to name result immediately after *connection to Damatic XD variable name* command was executed. For example, the following settings:

NoZeroOnItemActivation=99
ConnectionNameValueOK=98
ConnectionNameValueBad=97

will cause the following: value of **99** will be delivered to client application immediately after the item is activated and then after *connection to Damatic XD variable name* command was executed (for great amount of items it can take considerable time to execute this command for all items) depending on this command result the value of **98** will will be delivered to client application if connection was successful or value of **97** – if connection was unsuccessful. In case the connection was successful the real values from Damatic XD system will start to come and replace the value **98**.

Note!
*For **NoZeroOnItemActivation=**, **ConnectionNameValueOK=** and **ConnectionNameValueBad=** entries used with discrete variables (with syntax d"Damatic variable name") only positive values can be used.*

ShortShowSendReceive
As default, the DAMATIC I/O Server logs to Wonderware Logger ALL outgoing and incoming data if **Show Send** and/or **Show Receive** is checked in Server's System Menu. Sometimes for debugging purposes it would be necessary to decrease the total amount of logged information, this can be done by adding the following entry to WIN.INI file [DAMATIC] section:

ShortShowSendReceive =1

In this case only first eight bytes of send/receive messages will be logged: first four bytes contain the message type code and next for bytes contain the sequence number of message.

PasswordNotUsed
As default the DAMATIC I/O Server checks if the *User Password* is entered and if not then all writes to Damatic XD system are rejected. The checking of *User Password* can be disabled by adding the following entry

PasswordNotUsed=1

to the WIN.INI file [DAMATIC] section.

Troubleshooting menu

The following debugging choices are appended to the Server's System Menu (the menu which appears when you click the "-" box in the upper left hand corner of the Server window):

Suspend Protocol / Resume Protocol - these choices permit you to turn protocol processing on and off, what means that you can suspend access to the Damatic XD system.

Show Send - if checked then all outgoing data (contents of data packages sent from DAMATIC I/O Server to Damatic XD system) are displayed in hexadecimal format and saved in the log file.

Show Receive - if checked then all incoming data (contents of data packages received by DAMATIC I/O Server from Damatic XD system) are displayed in hexadecimal format and saved in the log file.

Show Errors - if checked then information about errors is displayed and saved in the log file.

Verbose - if checked then additional debug information is displayed and saved in the log file. This option can be used only for debugging purposes.

Dump - if you click on this item then information about sockets, topics, messages and associated points will be displayed and saved in the log file.

All debug output is displayed via the Wonderware Logger, which must be active for these commands to work. Warning: if you check **Show Send** and/or **Show Receive** and/or **Verbose** then debug output grows very fast.

Errors

The error displaying and logging in the DAMATIC I/O Server depends on the type and importance of error. Generally there are three types of error processing: displaying the information about error in the *Error Message Box*, displaying and logging the error information to *Wonderware Logger* and error logging to the *Error Logging File*.

Error Message Boxes

The information about most important errors is displayed in the message box, which appears on the top of computer screen. Typically there are errors which inform that normal execution of the *Server* is impossible and immediately user action is needed, e.g. “Not enough memory for socket data structure”.

Error logging to Wonderware Logger

The Wonderware Logger program (WWLogger) must be active and *Show Errors* debugging choice must be checked in the Server’s System Menu (see *Troubleshooting menu*) to display information about the *Serve*r run-time errors in the WWLogger screen and to record error data to the WWLogger log file.
The first time the WWLogger program is started up each day, by default it automatically creates a log file in the same directory in which it is installed (unless the different directory is specified via the */Options/Disk Options*). The log files are named in the format YYMMDD.AEH. All information from Error Message Boxes also is logged to WWLogger.

Error Logging File

The *error logging file* is a file (with default name ERRORS.DAT) which will contain all error messages received from the Damatic XD system. This file is updated by the *Server* if it becomes greater than 100 Kbytes or if included error messages are more than 1 week old.

The error logging file is filled depending on error codes received from the Damatic XD system. The DAMATIC I/O Server distribution disk contains the text file ERRMSGS.TXT containing default error messages. In this file special characters ‘$ ‘and ‘&’ are used for marking the start and end of error code (e.g. $2001& if error code is 2001).

The error logging file is filled in the following way. If some non-zero error code is received then the *Server* searches through file ERRMSGS.TXT for matching error code. If the matching error code is found then all text between this error code ‘&’ character and next ‘$’ character is added to the error logging file. If no matching error code is found then ERRMSGS.TXT last message “%lu - Unexpected ERROR received.” is added to the error logging file where “%lu” is converted to received error number. The file ERRMSGS.TXT is only a template and can be freely modified. Only the end part of this file (last three messages) starting from error code $9998& must remain unchanged.

To ease the maintenance of the error logging file the *Server* adds special character 0x02 and date and time in the format MM/DD/YY HH:MM:SS before each error message which is written to the error logging file.

KLINKMANN AUTOMATION
DAMATIC I/O Server
Revision History

Feb 95	Rev 1.0	First Release
Mar 95	Rev 1.1	Additions to Troubleshooting section
Nov 96	Rev 2.0	Interface changed to WinSockets. NT support added.
Nov 97	Rev 2.1	Minor changes. Write only to name added.
Feb 98	Rev 2.2	Additions to Troubleshooting section. NOF_PENDING_WRITES DDE item added.
Nov 98	Rev 2.3	Suite Link support added. User manual layout changed. Modifications in the manual text.
Dec 98	Rev 2.4	Installing the DAMATIC I/O Server section changed.
Mar 2000	Rev 2.5	KEEPALIVE item added. The NoZeroOnItemActivation= entry expanded.
Mar 2000	Rev 2.6	WIN.INI entries ConnectionNameValueOK= and ConnectionNameValueBad= added.
Mar 2002	Rev 2.7	Installation from CD information added.
Mar 2003	Rev 2.8	WIN.INI entries UseDamaticTime= and ShortShowSendReceive= added. Processing of CONNECTI.ONS file changed. WIN.INI entry NoZeroOnItemActivation=1 changed to default.